UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
Fire and Aviation Directorate
National Interagency Fire Center
Lead Agency for the Joint Fire Science Program

Joint Fire Science Program

The Joint Fire Science Program provides funding for scientific studies to address problems associated with managing wildland fuels, fires, and fire-impacted ecosystems.

Department of the Interior and Related Agencies Appropriation Act for FY 1998 and subsequent years
(P.L. 105-83; H.R. Report 105-163)

PROJECT ANNOUNCEMENT No. FA-RFA011-0001
Primary announcement (9 task statements)

CFDA No. 15.232
ISSUE DATE: September 23, 2010

JFSP Request for Applications (RFA) 2011-1

CLOSING DATE & TIME

November 19, 2010 5:00 pm MST

NOTE: JFSP has changed methods for funding proposals. Please read the eligible applicants and contacts sections closely. Further instructions for completing all templates are now instruction documents available on the appropriate tabs once a proposal has been initiated. If you have questions please call the program office.

Contact Information:

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TABLE OF CONTENTS

SECTION I. FUNDING OPPORTUNITY DESCRIPTION

A. Legislative Authority: Department of the Interior and Related Agencies Appropriation Act for FY 1998 and subsequent years (P.L. 105-83; H.R. Report 105-163).

B. Project Background Information: The Joint Fire Science Program (JFSP) is a partnership of six federal wildland management and research agencies with a need to address problems associated with managing wildland fuels, fires, and fire-impacted ecosystems. The partnering agencies include the U.S. Department of Agriculture, Forest Service and five bureaus in the U.S. Department of the Interior - Bureau of Indian Affairs, Bureau of Land Management, National Park Service, Fish and Wildlife Service, and the Geological Survey.

For further background on the JFSP, those considering submitting proposals are encouraged to visit our website at www.firescience.gov.

C. Program/Project Objective: The U.S. Congress directed the Department of the Interior and the USDA Forest Service to develop a Joint Fire Science Program and Plan to prioritize and provide sound scientific studies to support land management agencies. Current priorities are identified as task statements in this Request for Applications (RFA).

D. Statement of Joint Objectives/Project Management Plan: The JFSP Governing Board and Program Manager will establish an oversight relationship with the Principal Investigator and Federal Cooperator on each funded project. Projects will be required, at a minimum, to provide a written progress report annually.

E. Period of Project: The JFSP Governing Board generally anticipates that individual projects can be accomplished within three years or less.

SECTION II. AWARD INFORMATION

A. Expected Number of Awards: Approximately 20-25

B. Estimated Total Program Funding: Approximately $6,000,000 - $8,000,000

C. Award Ceiling: None

D. Assistance Instrument: To be determined at a later date by the JFSP.

SECTION III. ELIGIBILITY INFORMATION

A. Eligible Applicants: The JFSP encourages proposals from all interested parties. However, if a federal agency is requesting funding, or if the work is being completed through a private business, or has international involvement, then you must have a Federal Cooperator and funding will go through the federal cooperating agency. If the Federal Cooperator is from the Forest Service they must be from a Forest Service research station.

Proposals that do not require a Federal Cooperator will be funded directly by an award document (e.g., a cooperative agreement) between JFSP and the PI institution. The PI institution will be required to respond to a second posting on grants.gov to initiate funding. **NOTE**: This is a change from business practices in prior years.

Upon receipt of a fully executed award document, the institution receiving funds from JFSP will be responsible for all sub-award transactions to cooperators or contractors related to the

project. The end date for all sub-awards must match the end date in the original funding award document.

B. Cost Sharing or Matching: This program has no matching requirements.

SECTION IV. APPLICATION and SUBMISSION INFORMATION

A. Proposal Submission and Agency Contact

Your proposal must be submitted by 5:00 pm MST November 19, 2010, using the electronic submission process provided on the JFSP website www.firescience.gov. Proposals should not be submitted in Grants.gov. There will be no exceptions to this closing date and time.

All proposals must meet all requirements in Section D (Proposal Application Requirements). Proposals that do not meet all requirements in this section will not be considered for funding.

Proposals must be submitted in the appropriate task statement being addressed. The proposal will be reviewed and its merits judged in the context of this one task statement only.

Questions should be directed to:

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B. Task Statements

1. Re-measurement opportunities

The Joint Fire Science Program (JFSP) is seeking proposals to re-measure existing field studies to assess the effects of high-severity fire on vegetation succession, and/or to evaluate the effects of post-wildfire management. Proposals requesting funds to re-measure other variables will not be considered.

Knowledge of vegetation succession rates and patterns following high-severity fire is critical to land managers planning post-fire management and monitoring activities. Decisions regarding revegetation, erosion control, invasive species management, carbon management, and other vegetation management activities all depend on an accurate understanding of post-fire vegetation succession, especially following high-severity fire. Funds requested for re-measurement of plots in areas that did not experience high-severity fire will only be considered if re-measurement is necessary to understand and interpret the effects of high-severity fire. For purposes of this solicitation, high-severity fire is defined as greater than 70% mortality of aboveground biomass. Proposals must include field measurements of vegetation.

Large investments are made annually in post-wildfire management, often without strong knowledge of the long-term effectiveness and effects of implemented activities. JFSP is

interested in proposals that plan for remeasurement of plots originally installed to evaluate the effectiveness and effects of burned area rehabilitation, emergency stabilization, post-wildfire recovery, revegetation, and/or timber salvage activities. JFSP is particularly interested in the effects of these activities on fuel beds. A primary intent is to compare short-term responses to long-term responses to determine trends or uncover surprises.

Proposals must respond to a need to re-measure variables that will not otherwise be re-measured as part of a regular, ongoing program, and must clearly state the added value to be obtained from re-measurement. In other words, what will be learned from remeasurement that can help support or change post-fire management strategies?

Proposals must clearly describe the extent, format, and quality of the available pre-existing data, and describe the sampling design under which these data were collected. Proposals will only be considered if the experimental design, measurement methodology, data and results for the prior measurement(s) have been published in a peer-reviewed scientific journal. This publication must be referenced and attached to the proposal (Attachment 3). Proposals also need to include evidence that the plots have not been disturbed since the last measurement in any way that could substantially affect the validity of the results.

Proposals must describe the analysis methodology intended for comparison of pre-existing and newly collected data in sufficient detail to allow for an independent assessment of statistical methods. Proposals must also describe plans for data management, including how data will be combined for comparative analysis.

2. Shrub and grass fuelbed production, growth, and succession

Shrub and grass fuels drive fire behavior and effects over vast areas of nonforested land in the United States, and contribute significantly to surface fire behavior and effects in many forest lands. Nevertheless, these fuels have received comparatively little attention and investment as compared to tree fuels. The need to accurately evaluate and model shrub and grass fuels is increasing as expectations for quantitative risk assessments grow, and the infrastructure, habitat, recreational and other values on these lands are increasingly recognized.

The Joint Fire Science Program (JFSP) invites proposals that lead to better estimates of shrub and grass fuel production, growth, and succession, both on nonforested lands and as components of forest fuelbeds. JFSP is particularly interested in proposals that collect new field data that can be used to develop, improve, or validate shrub and grass production, growth and succession models. Proposals submitted in response to this task statement must address at least one of the following questions:

- How can the spatial and temporal variation in shrub and grass growth and production be best represented in fuel models?
- How do invasive species, grazing, and fires affect fuel loading and heterogeneity of shrub and grass fuels?
- How do shrub and grass fuel loading and production vary along post-fire successional trajectories?

Quantitative estimates of shrub and grass fuel loads, production rates, and succession should be further defined by specific factors that influence fire behavior and effects, or enable more accurate estimates of fuel loads, e.g., native perennial grasses, exotic perennial grasses, and annual grasses. Fuel estimates should be sufficiently detailed to described the complexity of the fuelbed for fire behavior modeling, including the continuity and properties of the fuel cluster (e.g., element type, size and condition; element orientation and spacing).

The management needs that are driving this task statement include improved models for predicting post-fire dynamics on non-forest landscapes, improved equations describing shrub and grass fuels to support fuels treatment planning, and improved shrub and grass production models to support fuel treatment planning and risk assessment on grazed landscapes.

JFSP is not interested in funding new software systems or user interfaces for immediate application by field users. Annual models of vegetation dynamics in nonforested areas could potentially be built into seasonal assessments issued by Predictive Services or used at a local level for vegetation or fuels management. Growth and succession computational models could potentially be incorporated into the Interagency Fuels Treatment Decision Support System (IFT-DSS) or other dynamic simulation models, such as the Forest Vegetation Simulator – Fire and Fuels Extension. The emphasis should be on evaluating and improving computational models developed with new field data. Computational models developed or improved from data collected with these proposals can be empirical, mechanistic, or some combination thereof. Independent data sets should be used to evaluate model performance.

3. Evaluating the effectiveness of mitigation activities in the wildland urban interface (WUI)

The Joint Fire Science Program (JFSP) invites proposals that collect new quantitative and qualitative data to evaluate the effectiveness of activities undertaken to reduce the impact of fire in the WUI. Property owners, communities and managers of adjacent public and private lands engage in a number of mitigation activities, but very little data has been gathered and analyzed to evaluate the effectiveness of WUI mitigation activities. Property owners and communities may hesitate to undertake a specific action because they do not know the relative effectiveness of each action intended to reduce risk in the WUI. Research is needed to fill these knowledge gaps so that decisions regarding WUI mitigation activities can be well informed.

A wide range of mitigation activities are currently implemented. Homeowners take steps requiring a range of resources from moving a wood pile away from a structure to replacing roofs and windows. Homeowner associations may enforce building codes, upgrade water sources, or improve development access. Counties may establish zoning or development regulations, or offer incentives for local-level wildfire planning. Managers of public and private forested areas may improve access for firefighters, create fuel breaks, and undertake projects to improve ecosystem health. Proposals should plan to collect new data to evaluate the effectiveness of these and other WUI mitigation activities singly, in combination, and on a comparative basis where feasible.

Proposals may also include provisions to develop and test new tools that can be used to collect and manage data to support future evaluation. For example, investigators may develop tools for states, counties, and local jurisdictions to use in monitoring the implementation of mitigation activities in their communities and assessing the potential effectiveness of these activities. Researchers may also choose to work with incident managers and communities to develop a post-fire assessment tool that can be used to collect a standard set of data following each fire that will build understanding of the social and biophysical impacts of fire in the WUI and the effectiveness of mitigation activities.

The most successful research proposals will help WUI communities and their partners evaluate the relative merit of different mitigation activities for reducing wildland fire risk given their local social and ecological contexts. In addition to direct impacts to homeowner property values, community-scale social and economic values such as aesthetics and infrastructure should be considered. Interdisciplinary and comparative studies are encouraged, as are international collaborations.

4. Fuel moisture influences on combustion

The Joint Fire Science Program (JFSP) is seeking proposals that investigate the various influences of fuel moisture on combustion processes. It is widely acknowledged that improved fire behavior prediction models are needed to advance understanding of wildland combustion and to support fire management. While the ultimate configuration of such models are unknown, it is clear that fundamental knowledge of the roles that fuel moisture plays in regulating combustion will be needed.

Historically, most of the effort to understand the role of fuel moisture in wildland combustion processes has focused on dead fuels, which respond passively to atmospheric conditions. In contrast, live fuel moisture is actively regulated by living plants in response to environmental changes. Despite this distinction, the influence of live fuel moisture on combustion has received relatively little attention. In fact, live fuel moisture in fire danger ratings is based on the moisture content of large, dead fuels, and recent experiments have shown that assumptions built into fire behavior models regarding live fuel moisture are false.

A more complete description of the role that fuel moisture plays in both live and dead fuels by dampening combustion and fire spread is required to advance fire behavior modeling, and for improving operational fire behavior interpretations. The following questions are suggestive of the kind of work JFSP is interested in supporting:

- How does fuel moisture influence preignition drying, thresholds of ignition, combustion rates, and transitions among combustion phases (including extinction) at a fuel particle scale?
- How does fuel moisture affect heat transfer between fuel particles, and what are the influences of fuel particle type and size?
- How much moisture remains in leaves and small branches when ignition occurs? How does this moisture affect continued combustion?
- How does the presence of soluble compounds in fuel moisture affect the energy required to ignite living foliage, and do variations in solute concentrations substantially affect ignition thresholds?

- Are there differences in live fuel moisture effects on combustion which are associated with lifeforms (tree, shrub, forb, etc.)?

Results from work funded under this task statement must advance scientific understanding and lay important ground work for advances in fire behavior modeling. Field and laboratory experiments that produce results that can be directly incorporated into physics-based models of fire behavior are encouraged. Model development proposed under this task statement should include provisions for model verification with an independent data set.

5. Black carbon effects on atmospheric warming

Recent research indicates that black carbon, (i.e., elemental carbon) emitted from prescribed fires and wildfires as a component of particulate matter may have a significant effect on atmospheric warming due to its physical and chemical properties. Once released into the atmosphere suspended black carbon particles absorb visible light and emit heat to the surrounding atmosphere. Additionally, black carbon particles deposited on snow-covered areas reduce albedo and increase snow melt rates. Transport of black carbon to the Arctic has been identified as a specific concern especially in the springtime when it can enhance snow melt.

Furthermore, black carbon interacts with atmospheric processes; warming the layer of the atmosphere it resides in while cooling the atmosphere at the surface. These processes can affect atmospheric stability and cloud processes. Black carbon exists in particles in the atmosphere that are also comprised of organic carbon and other trace inorganic chemicals. The physical and chemical properties of these particles vary depending on their emission source. For example, particles emitted from biomass burning have a larger fraction of organics and are less oily than particles emitted from fossil fuel burning. This has implications for how the particles absorb and/or scatter light, and interact with cloud processes.

While prescribed fires are only one source of black carbon emissions, potential legislative and regulatory actions directed at prescribed fires are under consideration by the US Congress and by the EPA, with potential legislative or regulatory action occurring in 2011. Many questions regarding the role and significance of black carbon emitted from fires both domestically and internationally remain unanswered.

The Joint Fire Science Program (JFSP) is interested in funding proposals that directly address at least one of the following questions:

- What are the contributions to atmospheric black carbon from prescribed fire and wildfire in the US? How do these contributions vary regionally and seasonally, and how do they compare to other sources of atmospheric black carbon?
- How do black carbon emission rates from prescribed fires and wildfire vary depending on the season of burning, fuel moisture content, or atmospheric conditions? How does fire type or intensity influence black carbon emissions, their vertical distribution in the atmosphere, and their potential for long range transport?

Proposals must discuss how the proposed work is related to other relevant work, such as that funded through EPA, and should clarify how new analyses compare with existing model runs and analyses. Proposals must describe underlying uncertainties in the emissions inventory or other data, and discuss methods used to assess, characterize or compensate for such

uncertainties, such as ensemble modeling. Proposals must also discuss the resolution and scale of scientific models to be used in the analysis, and provide evidence that the scale is appropriate to underlying management questions.

JFSP is particularly interested in testing results from models with independent field data, and in proposals that examine temporal trade-offs in black carbon emissions. Because of the urgency in answering many of these questions, proposals that can provide initial analyses and preliminary reports within 12-24 months are of particular interest.

A previously funded JFSP project (10-S-02-1) is designed to identify the source regions and seasonality of US black carbon emissions from fire that contribute to Arctic transport and deposition. Results from this initial short-term study should be available in 2011, and may help focus further study to address the questions above.

6. Fire smoke and ozone standards analysis

The federal Environmental Protection Agency (EPA) intends to propose new, more stringent ozone standards by August 31, 2010 (http://www.epa.gov/air/ozonepollution/actions.html - jan10s). From EPA's fact sheet on this issue, we quote:

"On January 6, 2010, EPA proposed to strengthen the national ambient air quality standards (NAAQS) for ground-level ozone, the main component of smog. The proposed revisions are based on scientific evidence about ozone and its effects on people and the environment. EPA is proposing to strengthen the 8-hour 'primary' ozone standard, designed to protect public health, to a level within the range of 0.060-0.070 parts per million (ppm). EPA is also proposing to establish a distinct cumulative, seasonal 'secondary' standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. EPA is proposing to set the level of the secondary standard within the range of 7-15 ppm-hours."

The new standards will be difficult for many locations around the US to achieve. This is especially true in the southwestern US where ozone monitors routinely exhibit concentrations in excess of 0.060 ppm for more than 8 hours. As a result many counties there, as well as in other parts of the country, will be unable to comply with the new ozone standard. This will cause State and local air quality managers to develop plans to limit emissions sufficient to achieve the new standards. All emissions that contribute to ozone will be scrutinized with consideration of the potential to reduce them.

Fire smoke emits chemicals (HCs and NOx) that are pre-cursors to ozone formation. Thus, fire smoke emissions will need to be addressed in such plans. Even before the ozone standard was reduced to 0.075 (it was 0.080 before 2008) states have been able to demonstrate that forest fires contributed to ozone standard exceedence. States have successfully argued to EPA that such forest fire driven ozone episodes should be classified as "exceptional events" allowing the State to remove those exceedences from their database and thus not have to develop emissions reduction actions for them. This has worked until the present as a way for state and local air quality managers to exclude large-fire emissions from emissions reduction strategies.

With the new lowered ozone standard, application of this policy is more difficult. For one thing, the standard is now so low that ozone in this concentration is measured in many places, even far removed from the traditional urban centers where elevated ozone concentrations have

historically been measured. Ozone near the standard appears to make up the background level of ozone in large regions away from cities. There are many contributing factors to this high ozone including long distance international transport and fire emissions.

The Joint Fire Science Program (JFSP) is soliciting proposals to determine what contributions to ambient ozone are due to wildland fire smoke in the United States, especially smoke from prescribed fires. Proposals must address both of the following objectives:

- Quantify the contributions from fires to ambient levels of ozone using tools and procedures that are similar to those that will be used by state and local air agencies in State Implementation Plan (SIP) development
- Use results of this quantification, ambient data, and any other available information to produce a ranked order of locations where fire emissions have the greatest potential to challenge attainment and maintenance of the new ozone standard

To satisfy the first objective, proposals will need to use existing fire emissions inventories, including emissions from wildfire and prescribed fire for current and anticipated future conditions. Regional air quality models and regional data analysis tools may be used to identify the incremental contribution of individual large wildfires as well as seasonal and regional prescribed fire activities. Proposals should focus on the new 8-hour (0.060-0.070 ppm) ozone standard in locations across the United State anticipated to have difficulty meeting the standard. Analyses should use at least one full year of data.

To satisfy the second objective, modeling and analysis results must demonstrate their skills in comparison with ozone data from regulatory and other regional data sets.

Due to the short-term nature of this issue, proposals that can complete work within 12-18 months are favored. Results of this work are intended to support fire, fuels and land managers participation in state implementation plan development and in designation of Non-Attainment Areas.

7. Mega-fire smoke and population impacts trajectory analysis

In recent years, fire managers worldwide have experienced fires that are extraordinary, in terms of their size, complexity, and resistance to control. Often termed “mega-fires”, these fires exhibit extreme fire behavior characteristics, and exceed all efforts at conventional control until relief in weather or a break in fuels occurs. Mega-fires produce smoke emissions in amounts far beyond prescribed fires or smaller wildfires, often degrading air quality and impacting human health and welfare in large urban areas. Such events have already occurred in the United States, Australia, Russia, Greece, and Indonesia.

Climate change is likely increasing the frequency and magnitude of these extreme wildland fires. In the western US large wildfire activity increased suddenly and markedly in the mid-1980s, with higher large-wildfire frequency, longer wildfire durations, and longer wildfire seasons (Westerling et.al 2006). Climate change projections suggest that annual mean area burned in the western United States may increase 54% by the 2050s relative to the present day (Spracklen et.al. 2009). Similar estimates are to be expected wherever the climate change trajectory is toward warmer and dryer conditions, suggesting a global increase in mega-fire.

A recent review (Molina & Molina 2004) summarized large city air quality, concluding that ozone and fine particulate are currently and are likely to remain challenges in these cities. Ozone causes human and ecological health impacts even at very low concentrations. Acknowledging this the US EPA has lowered its 8-hour ambient ozone standard to 0.060-0.070 parts per billion (ppb), roughly half its standard 15 years ago. Global background ozone levels range from 0.020 – 0.045 ppm and a forest fire can add 0.015 – 0.020 ppm to this background. Research also shows significant health impacts from very low concentrations aerosol particles smaller than 2.5 micrometers in diameter. Models of climate change exacerbated wildfire in the western US project increased summertime organic carbon (OC) aerosol concentrations of 40% and elemental carbon (EC) concentrations of 20% by 2050, with most of this increase (75% for OC and 95% for EC) caused by mega-fires (Spracklen et.al 2009).

The Joint Fire Science Program is soliciting proposals that will address the potential for smoke from mega-fires to impact large urban areas in the United States. Planned work should include both an assessment of potential source regions and an analysis of transport climatology to highlight which large urban areas are most likely to be impacted and in which seasons. Responsive proposals are expected to address some or all of the following items:

- Identify geographic areas in the US, and the season(s) of these areas, which appear to be most prone to future mega-fire events from a fuels and climate perspective
- Identify potential trajectories of mega-fire smoke to large urban areas of 500,000 or more in population, including an assessment of potential smoke event duration and magnitude
- Describe smoke impacts which might be expected in each area and/or develop a classification hierarchy (by smoke concentration levels or other criteria) of potential impacts that can be used to rate the severity of projected events
- Assess the potential for regional haze events due to mega-fires by US geographic areas and season(s)

Because analysis funded through submitted proposals is expected to be conducted with existing data, projects are expected to be completed in 18-24 months. Results from this work will highlight areas of particular concern with respect to air quality and wildland fire smoke, and to frame future work regarding the effects of mega-fire smoke on human populations.

Literature citations

1. Molina, M.J. and Molina, L.T. 2004. Megacities and Atmospheric Pollution. *J. Air & Waste Manage. Assoc. 54*:644–680

2. Spracklen, D.V., L.J. Mickley, J.A. Logan, R.C. Hudman, R. Yevich, M.D. Flannigan, and A.L. Westerling. 2009. Impacts of climate change from 2000 to 2050 on wildfire activity and carbonaceous aerosol concentrations in the western United States. *J. Geophys. Res. 114: D*20301.

3. Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity. *Science 313*: 940-943 .

8. Effectiveness and effects of pile burning

The Joint Fire Science Program (JFSP) invites proposals to evaluate the effectiveness and effects of pile burning. Pile burning following mechanical fuel treatment or logging is a common practice in many parts of the country. Piling slash or downed fuel for later burning

allows fuel removal from a site at a time when there is little risk of escaped fire, and/or when atmospheric conditions support desired smoke dispersion patterns. However, during the time between when piles are created in the operating season and when they are burned, often in late fall or winter, they represent a unique concentration of fuels and a potential fire hazard on the landscape.

Piles of logging slash or downed fuels can have a wide variety of characteristics. They may be piled by hand or by machine; they may be loosely packed or carefully stacked; they may be large and relatively far apart or small and closer together. And the fuel particles themselves vary in type, dimensions, moisture content, and other characteristics. Any of these factors could influence the effectiveness and effects of pile burning.

While there has been some recent work on pile burning (e.g., JFSP projects 06-2-1-39, 07-2-1-57, and 08-2-1-14), managers have many unanswered questions. Submitted proposals must address at least one of the following questions:

- How do the characteristics of piles created by different specifications and methods affect combustion dynamics, fuel consumption, and emissions? How do pile characteristics affect flame length, fireline intensity, and burn duration?
- How do the effects of pile burning on adjacent vegetation, invasive plants, and soils vary based on pile characteristics, and how do these effects vary by fuel and soil types?
- How does duff and soil moisture affect combustion type and duration, fuel consumption, and emissions?
- How do pile characteristics, pile age, and the spatial arrangement of piles affect the behavior of unplanned fires, including fireline intensity, fire spread between piles, and firebrand production and transport? How do piles burned in an unplanned fire contribute to crowning and crown fire spread, or to spotting?

This task statement is intended to address an immediate management question and should include activities and products that directly benefit fire and fuels managers. JFSP is most interested in proposals examining fuel types where pile burning is a common practice.

Proposals to develop or improve computational models must be based on new field data and include validation with an independent data set. New or improved models should be written to be callable as a service within the Interagency Fuels Treatment Decision Support System (IFT-DSS), and not as a standalone software system (see http://frames.nbii.gov/documents/jfsp/sts_study/ift_dss_software_design_specifications_20100521.pdf for more information).

9. Fuel treatments and the Wildland Urban Interface

High social and economic values within the Wildland Urban Interface (WUI), and continuing uncertainty regarding the value of fuel treatments conducted outside of the WUI, have led to increasing pressure to spend federal fuel treatment funds solely or largely within the WUI. Trade-offs inherent in policy choices that restrict expenditure of funds to the WUI are of two primary types: 1) the direct and indirect effects that fuel treatments outside of the WUI have on values within the WUI, and 2) the foregone opportunities to reduce risk to values outside of the WUI by concentrating fuel treatments within the WUI. After all, urban residents place high

value on restoring, enhancing and sustaining the diversity and productivity of our nation's wildlands.

Recent research has demonstrated the capability to conduct sophisticated landscape risk assessments that consider these trade-offs (Ager et al. 2010). The Joint Fire Science Program (JFSP) invites proposals to conduct similar risk analyses in other regions and land-use patterns, extends this capability, compares trade-offs across landscapes, or develops and applies other forms of risk or trade-off assessment to these issues. Results are intended to inform landscape planning and policy deliberations.

Underlying information gaps concerning fire spread and fire effects also limit understanding of these trade-offs. JFSP invites proposals that directly address the following questions:

- Under what conditions do treatments conducted outside the WUI influence fire behavior and fire effects in the WUI?
- What percentage of the landscape needs to be treated and in what patterns to affect fire spread into the WUI?
- Can fuel treatments outside of the WUI reduce fire ignitions in the WUI by reducing firebrand lofting and dispersion?

Research is also needed to further elaborate the values at risk in the WUI that are potentially affected by fuel treatments conducted inside or outside of the WUI. Values of concern within the WUI extend beyond the obvious private property values, including ecological services, utilities, and aesthetics, among others. In addition, there are important social questions regarding the demographic distribution of benefits obtained from fuel treatment regimes focused on the WUI versus those focused outside of the WUI. JFSP invites proposals that directly address how social and economic values in the WUI are affected by alternative patterns of fuel treatments.

Literature citation

Ager, Alan A., Nicole Vaillant, and Mark Finney. 2010. A comparison of landscape fuel treatment strategies to mitigate wildland fire risk in the urban interface and preserve old forest structure. Forest Ecology and Management 259:1556-1570.

C. Budget and Funding Policy

Federal Cooperator

Funding will be distributed from the JFSP to either the PI institution or the federal cooperating agency. The receiving institution will be responsible for any sub-awards to transfer funds to cooperating institutions. The JFSP will NOT issue funding to more than one institution on a proposal. If the Federal Cooperator is from the Forest Service they must be from a Forest Service research station.

If the PI for your project is a university or non-profit organization and no funds are being requested by a cooperating federal agency, the proposal will be funded through a cooperative agreement. Proposals selected for funding that do not require a Federal Cooperator will be required to respond to a second posting on grants.gov and will need to submit the necessary paperwork prior to receiving funding.

All selected awardees must be prepared to provide a valid Dun & Bradstreet Number (D&B). You can reactivate or obtain this at http://www.dnb.com or by calling 800-333-0505. There is a Federal Agency link on the Central Contractor Registration System (CCR) at htt://www.ccr.gov.

Indirect costs
The JFSP Governing Board recognizes the need of agencies and organizations participating in the program to recover reasonable indirect costs. However, cost effectiveness of the individual projects is a determining factor in the final selection process. Indirect rates for JFSP proposals are limited to a maximum of twenty (20) percent of the direct costs. The maximum indirect rate that a federal agency may charge for pass-through costs is ten (10) percent. Proposal with indirect rates higher than (20) percent will not be considered. Proposal funded through a Federal Cooperator must reflect either the prevailing indirect rate for the cooperating federal agency or the JFSP maximum limit of (20) percent, whichever is less.

SBIR costs
Certain proposals may be required to pay a percentage of the project's costs into the Small Business Innovation Research (SBIR) program. Proposals where the funds are transferred to a Forest Service institution and subsequently award a portion of the total budget to a non-federal entity through a sub-agreement or sub-contract may be required to pay 2.5% of the total funds awarded externally to the SBIR program. Check with your budget contact to determine if this applies to your proposal.

Salary policy
Normally, salaries of permanent full-time federal employees are expected to be provided by their agencies. This is also true of university faculty on 12-month tenure-track appointments. These employees are already fully funded by their institutions. However, the Governing Board recognizes there can be unique situations where the Governing Board may agree to fund the salary of permanent employees.

A detailed justification for funding the salary of permanent employees must be included in the proposal to be considered for funding. The justification should indicate all sources of funding, including other pending projects and associated full time equivalent (FTE) for the permanent position for which salary funding is requested. The justification must be by the supervisor of the individual requesting salary.

You must use the format found in Attachment 2 in the database for the certification. In addition, permanent employee salary costs must be explicitly identified in the project budget. The Governing Board requires no special justification (other than a brief description of the need for the position in the budget justification section of the proposal) for funding part-time, temporary, term employees, post-doctoral employees, graduate, or undergraduate students. Stipends are normally funded, but tuition fees will not be funded.

D. Proposal Application Requirements

Proposals must meet all of the following requirements to be considered. Incomplete proposals will not be considered. There will be no exceptions to either the submission deadline or other submission requirements. If you have questions about these requirements, please contact the

JFSP Program Office for clarification (Becky Jenison, 208.387.5958; John Cissel, 208.387.5349).

1. Proposal Submission – Proposals must be submitted electronically via the JFSP website (www.firescience.gov). Proposals should not be submitted in Grants.gov. Hard copy or facsimile proposals will not be accepted.

- Proposers must have a login and password to access the JFSP database to submit a proposal. Requests for access will be processed in approximately 24 hours.
- Only the PI can submit the proposal.
- Proposals can be saved in the JFSP system and submitted later if prior to the closing date and time. Submitted proposals can be reverted back to final draft by the PI prior to the closing date. If you revert a proposal back to draft you must resubmit the proposal before the closing date and time.
- The JFSP proposal submittal system will not allow proposals to be submitted after the closing date and time.

2. Contacts – Proposals must have the following contacts (see "Definitions") assigned to a proposal to be submitted:

- Principal Investigator (only one Principal Investigator can be assigned)
    - PI institution will receive funding from JFSP and will be responsible for processing sub-awards to cooperating institutions, unless a federal cooperating agency is receiving funds.
- Federal Cooperator
    - JFSP proposals no longer require a Federal Cooperator if the PI is from a University or a non-profit organization. However, if a federal agency is requesting funding, or if the work is being completed through a private business, or has international involvement, then you must have a Federal Cooperator and funding will go through the federal cooperating agency. If the Federal Cooperator is from the Forest Service they must be from a Forest Service research station.
    - It is the PI's responsibility to ensure a Federal Cooperator is listed as a contact on the contacts tab, if necessary.
- Budget contact
    - Budget contact must be from the institution receiving funds from JFSP. If a federal agency is requesting funds the budget contact must be from the federal cooperating agency. This person is responsible for ensuring the budget is correct prior to proposal being submitted and is willing to facilitate the transfer of funds, if necessary.
- Grants and agreements contact
    - Grants and agreements contact must be from the institution receiving funding from JFSP. If a federal agency is requesting funds the grants and agreements contact must be from the federal cooperating agency. This person must be willing to facilitate the receipt of funds and execution of any sub-agreements or contracts necessary if your proposal is funded.
- All contacts must be entered on the contacts tab in the JFSP database by the Principal Investigator. Contacts must be registered and have a profile in the system to be added as

a contact. If you have registered in the past you will still be in the system. New profiles may take up to 24 hours to be created.

- It is the responsibility of the individual contacts to ensure that the contact information in the JFSP electronic submission system is correct, including affiliation, e-mail, phone number and address.
- Co-PIs and collaborators are not required on a proposal; however, if they are involved with a proposal they must be entered on the contacts tab.

3. Confirmation Page – When you submit your proposal you will receive a confirmation page. We highly recommend that you save or print this page for your records. You should receive an e-mail from the JFSP Program Office letting you know that your proposal has either been forwarded for review, or rejected for not meeting administrative requirements. If you do not receive this e-mail by December 17, 2010 you should fax or e-mail your confirmation to Becky Jenison at Becky_Jenison@blm.gov or Fax: 208-387-5960 as soon as possible. **If you do not receive this confirmation page you have not submitted your proposal correctly**.

4. Attachments – All required documents must be attached before the proposal is submitted. Attachments over the page limit cannot be submitted. Extra graphs and text are not permitted and will not be reviewed.

Required attachments

- Attachment 1 – Details tab
  - The body of the proposal (must use required template)
- Attachment 2 – Details tab
  - C.V.s of the PI (2 page maximum) and co-PIs (1 page maximum)
  - Letter(s) of support (optional)
  - Salary justification (may be required, see below)
- Attachment 3 – Budget tab
  - Budget format (must use required template)

5. Budget – Budget summary numbers must be input in the JFSP database on the budget tab and the budget detail must be attached the spreadsheet template provided. Proposals cannot be submitted without completing these required fields. **NOTE**: This is a change from prior year business practices.

Budgets must be reviewed by your budget contact to ensure all costs have been included and the budget is correct. JFSP will not provide additional funds to cover errors discovered after the proposal submission deadline.

6. Task Statement – Proposals that do not clearly and directly meet the intent of the task statement selected will not be considered for funding. Please make sure you are submitting your proposal to the correct task statement in the system.

7. Format – Proposals not following the required template will not be considered. Proposals must use an 11 point font or larger. Additional guidance is in the proposal instruction document.

8. Page Limits – Proposals (Attachment 1 on the details tab) exceeding the page limit cannot be submitted. Page limits may vary by task statement; check the page limit in the JFSP database for each specific task statement.

9. Project Location - Project location fields must be completed on the location tab for a proposal to be successfully submitted. Instructions are listed on the project location tab.

10. Signatures – Handwritten signatures are no longer required. When Principal Investigators (PIs) submit proposals they will be prompted to input their password. By typing in the password PIs certify that "All contacts on this proposal have reviewed the proposal and understand what their role requires. As the Principal Investigator I am certifying that the budget contact and grants and agreements contact have reviewed the budget and are prepared to receive funds from JFSP and execute sub-agreements or contracts if the proposal is funded."

11. Indirect Costs – JFSP will not consider proposals asking for more than 20% indirect costs and/or more than 10% pass-through costs.

12. In-kind Contributions – JFSP does not have a standard ratio or minimum requirement for in-kind contributions. However, in-kind contributions are an evaluation factor.

13. Support Letters – Support letters are encouraged, but not required. Support letters are useful if they show understanding of the proposed work and the author articulates how the work will benefit them. Support letters that appear to be ghost-written by the PI or are form letters are much less useful. If submitted, letters must be attached as part of Attachment 2. Support letters sent by hard copy or email directly to JFSP will not be considered.

14. Salary Justifications - Salary justifications are only required if the proposal is requesting funds for salary of permanent or tenured employees for a portion of the year normally covered by permanent or tenured funding. If required, salary justifications must contain all of the requested information and be signed electronically by the supervisor of the individual requesting salary coverage. Salary justifications must be attached as part of Attachment 2.

15. Past-due Projects – No proposals will be considered if the work will include a PI or Co-PI who is a PI or Co-PI on a JFSP project that is past due as of the closing date of this announcement. See the JFSP website for the complete JFSP past due and extension request policy.

SECTION V. APPLICATION REVIEW and EVALUATION INFORMATION

Overview

Proposals will be reviewed in four stages:

1. JFSP Program Office – Administrative requirements and task statement intent
2. Peer Review – Relevancy, technical merit, products, and feasibility
3. Governing Board Review – funding decisions
4. Statistical Review (optional) – Adequacy of study design and analysis methods

Review Criteria

Relevancy

- Importance of the proposal to the land management community.
  - To whom and at what level (national, regional, local)?
  - At what time frame?
    - Immediate application
    - Science to build on
    - Proof of concept
- Importance of the proposal to the science community.

Technical Merit

- Does the proposal directly address the RFA and relevant task statement?
- Are objectives and hypotheses clearly articulated?
- Are methods appropriate for stated objectives?
- Can hypotheses be answered with the proposed design and analysis?

Products, Deliverables and Science Application

- What is the final product and why is it important?
- What will it do, and who will use it or want it?
- Who will deliver it and how will it be delivered?
- Is it something completely new or does it build on or enhance an existing application?

Feasibility

- Administrative adequacy
  - Budget
  - Skills and qualifications
  - Probability of success
  - Barriers
  - NEPA
- Collaboration
  - Manager/scientist interaction and problem framing
  - Local management commitment
  - Does the proposal have in-kind contributions?

SECTION VI. DEFINITIONS

Request for Applications (RFA): Joint Fire Science Program method of requesting project proposals. The RFA includes task statements for which proposals are sought, instructions for proposal submission, and related information.

Principal Investigator (PI): The individual identified in a proposal who is the research lead for the project. This individual is responsible for coordinating all research related activities and will be the primary science contact for the project. In addition the PI is responsible for communicating and coordinating with Co-PIs and others on the research team. The PI is responsible to JFSP for completion of the project.

Federal Cooperator: Federal Cooperator is only required on a proposal if a federal institution is requesting funding in a proposal, or if the work is being completed through a private business, or has international involvement. This individual **must be a federal employee** and is responsible for coordinating with the PI, the grants and agreements contact, and the budget contact on administrative activities for this project. The Federal Cooperator will be one of the primary contacts for the project and should stay informed and involved in project activities. If the Federal Cooperator is from the Forest Service they must be from a Forest Service research station.

Budget Contact: Budget person from the institution receiving funds from JFSP that is responsible for ensuring budget detail is correct and agrees to receive funds if a proposal is selected for funding. If a federal agency is requesting funds the budget contact must be from the federal cooperating agency.

Grants and Agreements Contact: Person from institution receiving funds from JFSP that is responsible for facilitating the receipt of funds and the execution of any agreements or contracts necessary for a proposal if it is selected for funding. If a federal agency is requesting funds the grants and agreements contact must be from the federal cooperating agency.

Co-Principal Investigator (Co-PI): The individual(s) identified in a proposal who will work with the research lead on the project and makes a substantial contribution to the project. The Co-PI is responsible for communicating and coordinating with the PI.

Indirect Costs: Those costs that are a percentage of the total cost used to pay for overhead/administrative costs attributable to a specific research project. Examples include the cost of operations and maintenance such as janitorial, phone, and clerical services. The Joint Fire Science Program recognizes two types of indirect costs: 1) "in-house" costs incurred by the agency, institution, or unit completing the research; and 2)"pass-through" costs associated with sub-awarding project funds to another agency, institution, or entity for the purpose of completing research or science delivery.

Joint Fire Science Program Governing Board: An appointed, 10-person Board representing the JFSP partnering agencies. The Board provides strategic direction and oversight to JFSP, identifies important research questions, selects proposals for funding, supervises the JFSP Program Manager, and conducts related business.

Science Delivery and Application: The transfer of information, materials, models and other research deliverables to end users, along with adequate information and training to apply the

deliverables. Examples of active methods include workshops, training sessions, guided field tours, conferences, meetings, and symposia. Examples of passive methods include published papers and websites. A combination of active and passive methods is preferred.

Task Statement: A specific area of interest, identified in the RFA, for which proposed project applications are sought.